CLAIMS

1. A multidirectional inertial device having a plurality of preferential detection axes, comprising:

inertial sensor means, which are sensitive to accelerations parallel to said preferential detection axes;

transduction means, coupled to said inertial sensor means and supplying a plurality of acceleration signals, each of which is correlated to an acceleration parallel to a respective one of said preferential detection axes;

first comparison means, connected to said transduction means and supplying a pre-determined logic value when at least one of said acceleration signals is greater than a respective upper threshold; and

second comparison means, connected to said transduction means and to said first comparison means for supplying said pre-determined logic value when each of said acceleration signals is greater than a respective lower threshold, which is smaller than the respective upper threshold.

2. The device according to claim 1 wherein said first comparison means comprise, for each said preferential detection axis, a respective first comparator, which receives the respective one of said upper thresholds and receives the respective one of said acceleration signals, and at least one first logic gate, connected to each first comparator.

3. The device according to claim 2 wherein said second comparison means comprise, for each of said preferential detection axes, a respective second comparator, which the respective one of said lower thresholds and receives the respective one of said acceleration signals, and at least one second logic gate, connected to each second comparator.

4. The device according to claim 1 wherein said upper thresholds are equal to one another, and said lower thresholds are equal to one another.

5. The device according to claim 1 wherein the ratio between the upper threshold and the lower threshold corresponding to a same one of said preferential reference axes is substantially equal to $1/\sqrt{2}$.

6. The device according to claim 1 wherein said inertial sensor means comprise at least one micro-electro-mechanical sensor with capacitive unbalancing.

7. The device according to claim 6 wherein said inertial sensor means comprise a micro-electro-mechanical capacitive-unbalance sensor for each of said preferential detection axes.

8. The device according to claim 6 wherein said transduction means comprise:

at least one current-to-voltage converter, connectable to said at least one micro-electro-mechanical sensor;

a subtractor node, having a non-inverting input connected to an output of said current-to-voltage converter;

an inverting input;

a filter, connected between said output of said current-to-voltage converter and said inverting input of said subtractor node; and

a rectifier, which is connected to an output of said subtractor node and supplies at least one of said respective acceleration signals.

9. A portable electronic apparatus, comprising:

a device for reactivation from stand-by, said device including a multidirectional inertial device that includes:

inertial sensor means, which are sensitive to accelerations parallel to each of a plurality of preferential detection axes;

transduction means, coupled to said inertial sensor means and supplying a plurality of acceleration signals, each of which is correlated to an acceleration parallel to a respective one of said preferential detection axes;

first comparison means, connected to said transduction means and supplying a pre-determined logic value when at least one of said acceleration signals is greater than a respective upper threshold; and

second comparison means, connected to said transduction means and to said first comparison means for supplying said pre-determined logic value when each of said acceleration signals is greater than a respective lower threshold, which is smaller than the respective upper threshold.

10. A method for detecting the state of motion of a device, comprising:

generating a plurality of acceleration signals, each of which is correlated to an acceleration parallel to a respective preferential detection axis;

supplying a pre-determined logic value when at least one of said acceleration signals is greater than a respective upper threshold; and

supplying a pre-set logic value when each of said acceleration signals is greater than a respective lower threshold, which is smaller than the respective upper threshold.

11. The method according to claim 10 wherein said higher thresholds are equal to one another, and said lower thresholds are equal to one another.

12. The method according to claim 10 wherein the ratio between the upper threshold and the lower threshold corresponding to a same one of said preferential reference axes is substantially equal to $1/\sqrt{2}$.

13. A device, comprising:

an acceleration circuit configured to produce a dynamic acceleration signal corresponding to a level of acceleration in each of a plurality of detection axes;

a comparator circuit for each of the detection axes, configured to compare the respective dynamic acceleration signal with respective higher and lower threshold signals; and

a logic circuit configured to produce a selected logic value at an output if the dynamic acceleration signal of any of the plurality of detection axes exceeds its respective higher threshold, or if the dynamic acceleration signals of any two of the plurality of detection axes exceeds their respective lower thresholds.

14. The device of claim 13 wherein the acceleration circuit comprises:

a sensor configured to sense acceleration in each of the detection axes; and

a transduction circuit for each of the detection axes, each transduction circuit configured to receive from the sensor an acceleration value corresponding to a level of acceleration in the respective one of the detection axes and to produce the respective dynamic acceleration signal.

15. The device of claim 14 wherein each of the transduction circuits is configured to subtract, from the respective acceleration value, a respective static acceleration value, thereby producing the respective dynamic acceleration signal.

16. The device of claim 14 wherein the sensor comprises a micro-electro-mechanical capacitive-unbalance sensor for each of the plurality of detection axes.

17. The device of claim 13 wherein the acceleration circuit comprises:

a sensor configured to sense acceleration in each of the detection axes; and

a transduction circuit configured to receive from the sensor an acceleration value corresponding to a level of acceleration in each of the plurality of detection axes, sequentially, and to produce, for each detection axis, its respective dynamic acceleration signal.

18. The device of claim 13 wherein the number of detection axes is two.

19. The device of claim 13, further comprising a cell phone.

20. The device of claim 13, further comprising a portable computer.

21. A method, comprising:

sensing acceleration of a device in each of a plurality of axes;

comparing respective levels of the acceleration in the axes with a high threshold;

comparing the respective levels of the acceleration in the axes with a low threshold;

producing a selected logic value if the level of the acceleration with respect to any one of the plurality of axes exceeds the high threshold; and

producing the selected logic value if the level of the acceleration with respect to any two of the plurality of axes exceeds the low threshold.

22. The method of claim 21 wherein each of the plurality of axes lies at right angles to each other.